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McGraw-Hill Dictionary of Scientific and Technical Terms

Fifth Edition

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Editor in Chief



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On the cover: Photomicrograph of crystals of vitamin B₁₂.
(Dennis Kunkel, University of Hawaii)

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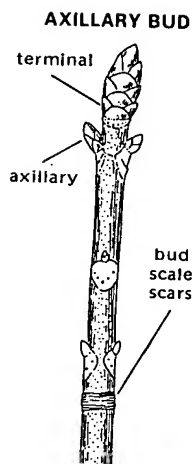
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Position of axillary bud in the buckeye.

the centroid of a particular section and being perpendicular to the plane of the section. { 'ak-sē-əl 'lōd }

axial mining [ORD] Continuous or intermittent nuisance mining in great depth along the axis of enemy advance. { 'ak-sē-əl 'mīn-īŋ }

axial modulus [MECH] The ratio of a simple tension stress applied to a material to the resulting strain parallel to the tension when the sides of the sample are restricted so that there is no lateral deformation. Also known as modulus of simple longitudinal extension. { 'ak-sē-əl 'māj-ə-ləs }

axial moment of inertia [MECH] For any object rotating about an axis, the sum of its component masses times the square of the distance to the axis. { 'ak-sē-əl 'mō-mənt əv in'ər-shə }

axial musculature [ANAT] The muscles that lie along the longitudinal axis of the vertebrate body. { 'ak-sē-əl 'məs-kyə-lə-čər }

axial nozzle [MECH ENG] An inlet or outlet connection installed in the head of a shell-and-tube exchanger and aligned normal to the plane in which the tube lies. { 'ak-sē-əl 'nāz-əl }

axial plane [CRYSTAL] 1. A plane that includes two of the crystallographic axes. 2. The plane of the optic axis of an optically biaxial crystal. [GEOL] A plane that intersects the crest or trough in such a manner that the limbs or sides of the fold are more or less symmetrically arranged with reference to it. Also known as axial surface. { 'ak-sē-əl 'plān }

axial-plane cleavage [GEOL] Rock cleavage essentially parallel to the axial plane of a fold. { 'ak-sē-əl 'plān, klē-vij }

axial-plane foliation [GEOL] Foliation developed in rocks parallel to the axial plane of a fold and perpendicular to the chief deformational pressure. { 'ak-sē-əl 'plān, fō-lē'ā-shən }

axial-plane schistosity [GEOL] Schistosity developed parallel to the axial planes of folds. { 'ak-sē-əl 'plān, 'shis'tās-əd-ē }

axial-plane separation [GEOL] The distance between axial planes of adjacent anticline and syncline. { 'ak-sē-əl 'plān sep-ə-rā-shən }

axial quadrupole See longitudinal quadrupole. { 'ak-sē-əl 'kwād-rə-pōl }

axial rake [MECH ENG] The angle between the face of a blade of a milling cutter or reamer and a line parallel to its axis of rotation. { 'ak-sē-əl 'rāk }

axial ratio [CRYSTAL] The ratio obtained by comparing the length of a crystallographic axis with one of the lateral axes taken as unity. [ELECTR] The ratio of the major axis to the minor axis of the polarization ellipse of a waveguide. Also known as ellipticity. { 'ak-sē-əl 'rā-shō }

axial relief [MECH ENG] The relief behind the end cutting edge of a milling cutter. { 'ak-sē-əl 'rī-lēf }

axial runout [MECH ENG] The total amount, along the axis of rotation, by which the rotation of a cutting tool deviates from a plane. { 'ak-sē-əl 'rən-əut }

axial skeleton [ANAT] The bones composing the skull, vertebral column, and associated structures of the vertebrate body. { 'ak-sē-əl 'skel-i-tən }

axial stream [HYD] 1. The chief stream of an intermontane valley, the course of which is along the deepest part of the valley and is parallel to its longer dimension. 2. A stream whose course is along the axis of an anticlinal or a synclinal fold. { 'ak-sē-əl 'strēm }

axial surface See axial plane. { 'ak-sē-əl 'sər-fəs }

axial symmetry [MATH] Property of a geometric configuration which is unchanged when rotated about a given line. { 'ak-sē-əl 'sīm-ə-trē }

axial trace [GEOL] The intersection of the axial plane of a fold with the surface of the earth or any other specified surface; sometimes such a line is loosely and incorrectly called the axis. { 'ak-sē-əl 'trās }

axial trough [GEOL] Distortion of a fold axis downward into a form similar to a syncline. { 'ak-sē-əl 'trōf }

axial-type mass flowmeter [ENG] An instrument in which fluid in a pipe is made to rotate at a constant speed by a motor-driven impeller, and the torque required by a second, stationary impeller to straighten the flow again is a direct measurement of mass flow. { 'ak-sē-əl 'tīp 'mas 'flō, med-ər }

axial vector See pseudovector. { 'ak-sē-əl 'vek-tər }

axial winding [MATER] A winding used in filament-wound fiberglass-reinforced plastic construction in which the filaments run along the axis at a zero helix angle. { 'ak-sē-əl 'wind-īŋ }

axiation [EMBRYO] The formation or development of axis structures, such as the neural tube. { 'ak-sē-ā-shən }

Axiidae [INV ZOO] A family of decapod crustaceans, including the hermit crabs, in the suborder Reptantia. { 'ak-sī-ā-īd }

axil [BIOL] The angle between a structure and the axis from which it arises, especially for branches and leaves. { 'ak-səl }

axilla [ANAT] The depression between the arm and the thoracic wall; the armpit. [BOT] An axil. { 'ak-sil-ə }

axillary [ANAT] Of, pertaining to, or near the axilla or armpit. [BOT] Placed or growing in the axis of a branch or leaf. { 'ak-sə-lər-ē }

axillary bud [BOT] A lateral bud borne in the axil of a leaf. { 'ak-sə-lər-ē 'bəd }

axillary sweat gland [ANAT] An apocrine gland located in the axilla. { 'ak-sə-lər-ē 'swet, gland }

Axinellina [INV ZOO] A suborder of sponges in the order Clavaxinellida. { 'ak-sə-nə-lī-nə }

axinite [MINERAL] $H_2(Ca, Fe, Mn)_4(BO)Al_2(SiO_4)_5$ Brown, blue, green, gray, or purplish gem mineral that commonly forms glassy triclinic crystals. Also known as glass schorl. { 'ak-sə-nīt }

axinitization [GEOL] The replacement of rocks by axinite, as in the border zones of some granites. { 'ak-zīn-ə-tā-zā-shən }

axiolite [MINERAL] A variety of elongated spherulite in which there is an aggregation of minute acicular crystals arranged at right angles to a central axis. { 'ak-sē-əl, līt }

axiom [MATH] Any of the assumptions upon which a mathematical theory (such as geometry, ring theory, and the real numbers) is based. Also known as postulate. { 'ak-sē-əm }

axiomatic S-matrix theory [PARTIC PHYS] An approach to the study of elementary particles that seeks to formulate S-matrix theory in a rigorous manner based on a few fundamental axioms that include Lorentz invariance, unitarity, analyticity near the physical values of the energy and momentum variables, and singularities in the physical region that correspond to known particles and scattering thresholds. { 'ak-sē-ə, 'mad-ik 'es, mē-triks, thē-ə-rē }

axiom of Archimedes [MATH] The postulate that if x is any real number, there exists an integer n such that n is greater than x . Also known as Archimedes' axiom. { 'ak-sē-əm əv, 'ark-ə'mē, dēz }

axiom of choice [MATH] The axiom that for any family A of sets there is a function that assigns to each set S of the family A a member of S . { 'ak-sē-əm əv 'chōis }

axion [PARTIC PHYS] A hypothetical neutral pseudoscalar boson with mass roughly of order 100 keV to 1 MeV, postulated to preserve the parity and time-reversal invariance of strong interactions, despite the effects of instantons. { 'ak-sē-ən }

axis [ANAT] 1. The second cervical vertebra in higher vertebrates; the first vertebra of amphibians. 2. The center line of an organism, organ, or other body part. [GEOL] 1. A line where a folded bed has maximum curvature. 2. The central portion of a mountain chain. [GRAPHICS] The locus of intersection of two pencils of lines in perspective position. [MATH] 1. In a coordinate system, the line determining one of the coordinates, obtained by setting all other coordinates to zero. 2. A line of symmetry for a geometric figure. 3. For a cone whose base has a center, a line passing through this center and the vertex of the cone. [MECH] A line about which a body rotates. { 'ak-səs }

axis cylinder [CYTOL] 1. The central mass of a nerve fiber. 2. The core of protoplasm in a medullated nerve fiber. { 'ak-səs 'sil-ən-dər }

axis of abscissas [MATH] The horizontal or x axis of a two-dimensional cartesian coordinate system, parallel to which abscissas are measured. { 'ak-səs əv ab'sis-əs }

axis of acoustic symmetry [ACOUS] An axis such that the three-dimensional directivity pattern of a transducer may be generated by rotating a two-dimensional directivity pattern around it. Also known as acoustic axis. { 'ak-səs əv ək'ū-sīk 'sīm-ə-trē }

axis of circulation [ELECTROMAG] The axis where the equiphase surfaces of a circulating electromagnetic wave converge. { 'ak-səs əv, 'sər-kyə-lā-shən }

axis of freedom [DES ENG] An axis in a gyro about which a gimbal provides a degree of freedom. { 'ak-səs əv frēd-əm }

axis of homology [MAP] The intersection of the plane of the photograph with the horizontal plane of the map or the plane of